BOOK REVIEWS

STATISTICS AND EXPERIMENTAL DESIGN by Geoffrey M. Clarke, with pp. xi + 161. London: Edward Arnold (Publishers) Ltd., 1969. 42/- (£2.10p).

This book is written for biologists by an author with considerable experience of working with research biologists and teaching students of biology. At the same time, the general principles of elementary statistics covered by the text will be of interest to non-biologists. This is a comparatively low priced text in the Contemporary Biology Series edited by Professors Barrington and Willis. It consists of 136 pages of text divided into seventeen chapters, one page of references and bibliography, twelve pages of answers to and comments upon exercises, and an index in two parts—one to statistical terms and the other to topics used as examples.

This small text is an admirable introduction to statistics for the non-mathematical student in his second year at a South African university. The book begins by defining population, samples and variates and illustrating methods of summarising data by means of charts. The concept of probability is, as usual, introduced through the Binomial Distribution. This is followed by a consideration of the Poisson and Normal Distributions. Other tests of significance fully dealt with are the distributions based on Students t, Chi-squared and F. Linear regression and the Analysis of Variance are briefly touched on in Chapter II. However, subsequent chapters dealing with Experimental Design introduce the reader to the practical application of the Analysis of Variance in considerable detail. The importance of experimental design and the conditions that must be satisfied before an analysis of variance is undertaken, are as one would expect, properly stressed and the ways by which they may be attained are described.

Each chapter contains suitably worked examples chosen from the wide field of experimental biology and at the end of each chapter, exercises are given. This enables a student to use the book independently of a tutor and obtain a clear insight into elementary statistics, particularly by working out the exercises and checking his conclusions with the answers and comments at the end of the book.

This book is recommended to all interested in the application of statistics to problems in the fields of agriculture, plant physiology, ecology, entomology, genetics, cytology and microbiology.

E. S. TWYMAN

THE SYSTEMATIC IDENTIFICATION OF FLAVONOIDS by T. J. Mabry, K. R. Markham and M. B. Thomas, with pp. xi + 354. Berlin: Springer-Verlag, 1970.

A text of this nature is long overdue, and Professor Mabry, with some twenty papers relating to studies into the flavonoids of *Baptisia spp.* emerging from his school in Texas since 1965, is highly qualified to have undertaken this task. The book is arranged in three clearly defined parts: Part I—the isolation, purification and preliminary identification of flavonoids; Part II—the structure analysis of flavonoids by ultraviolet spectroscopy; Part III—the structure analysis of flavonoids by proton nuclear magnetic resonance spectroscopy. These parts indeed combine to achieve the objective of the book. Though the field is specifically limited to the flavones, flavonols, flavanones, flavanonols, isoflavones, chalcones and aurones as well as their glycosides, it is nevertheless treated in great detail both in the practical aspects and in the interpretation of the results. In Part I for example, full details are given for the construction of a simple chromatography cabinet and for the preparation of polyamide for column chromatography. Owing to their greater stability, tertiary butyl alcohol chromatographic solvents are preferred to the conventional l-butanol systems. In Part II, full details on the methods employed in obtaining UV spectra are presented and the interpretation of the spectra is thoroughly discussed with ample illustrations. The inclusion in this Part of comprehensive data relating to the chromatographic and UV spectral properties as well as spectral charts of 175 flavonoids enhances the practical value of this book. In Part III, the techniques used to prepare compounds for NMR analysis, particularly as their trimethylsilyl ethers, and the interpretation of the NMR spectra are described in detail. This part, like the preceding one, concludes with full NMR spectra of 125 flavonoids as their TMS ethers.

As a whole the book is clearly and attractively presented with remarkably few errors. The reviewer found one spelling error (p. 16, line 3 from the bottom should read "may" for "many") and one printing error (in Table V-1 on p. 42, should have ref. "*b*" for "*a*" next to Morin). More pedantic readers would prefer the term "aqueous ammonia" for "ammonium hydroxide" (p. 7, line 1) and in the formulae on pp. 8 and 9, the symbols R^1 and R^2 for R_1 and R_2 respectively. The only serious fault is the omission of the numbering of the pages which contain the UV spectra. However there is an erratum sheet which must be consulted in conjuction with the subject index when one wishes to locate the UV spectra of a particular flavonoid.

These criticisms, however, become insignificant in comparison to the value of the book which has unquestionably achieved its objective. This book deserves a readily accessible place among the reference books in any laboratory engaged in the chemistry of plant products.

J. F. ELSWORTH

PLANT STRUCTURE AND DEVELOPMENT: A PICTORIAL AND PHYSIOLOGICAL APPROACH by T. P. O'Brien and M. E. McCully, with pp. viii + 114, figs. 155. Macmillan, 1969. £5.

This is an unconventional and interesting book. The sub-title is misleading in that the treatment of structure is hardly more physiological than is nowadays customary. On the other hand a pictorial approach can too often be equated with superficiality, which, taking the book as a whole, is not a criticism which can be made here. The plan followed consists of a summary of contemporary views of the structure and development of the plant cell, shoot apex, root, stem, leaf, reproductive tissues and seeds. The reader is directed to further study by the provision of carefully selected, up-to-date and readily available references.

It should be pointed out that, contrary to the suggestion in the preface, this is not a book for beginners. The text is concise to the point of brevity, although the numerous illustrations form an integral part of the narrative. However, the discerning reader will find that many established ideas are presented in a new light and that there is much that is provocative.

A commendable feature is the specification of the methods of preparation of the material upon which the illustrations are based. Much use is made of excellent electron-micrographs, and of photomicrographs based on the techniques of Feder & O'Brien. The histochemical approach is interesting but one would wish for a more comprehensive statement of the significance of the PAS and toluidine blue staining reactions. Many of the photomicrographs are very good but the imposed limitation of techniques has resulted in some which are definitely inferior, such as those of the stem apex, micro- and mega-gametogenesis.

Lastly, it is improbable that this book would be bought for the coffee table. The lavish style of production is therefore unnecessary and the equivalent of 18 pages which are either blank or bear only a chapter heading and a botanical embellishment would have been better utilised in the expansion of the text.

A. R. A. NOEL